Claims

1. Plasma-generating device (1), comprising
   - at least one first plasma-generating section (A), wherein at least one first plasma (2) is generated; and
   - at least one second plasma-generating section (B), wherein at least one second plasma (3) is generated;

   wherein at a given point of time said first and said second plasmas (2,3) are of different polarity.

2. Plasma-generating device (1), comprising
   - at least one plasma-generating section (A), wherein a plasma (P) is generated between electrodes (8,9);
   - a conveyor (17) for controlling the conveyance-speed of a gaseous medium (4) through the plasma-generating section (A);
   - an AC power supply (18) which is connected to said electrodes (8,9) to generate alternating plasmas (2,3) of different polarity;

   wherein the power supply (18) operates with a frequency that is adapted to the conveyance-speed of the gaseous medium (4) suchlike that substantially all of the gaseous medium (4) is subjected to both of said plasmas (2,3) of different polarity at least once.

3. Device (1) according to one of claims 1 or 2, wherein the device (1) comprises a chamber and/or an open space allowing for contacting a gaseous medium (4) with said first and said second plasmas (2,3).

4. Device (1) according to one of claims 1 to 3, wherein said first and second plasmas (2,3) are corona discharge plasmas.

5. Device (1) according to one of claims 1 to 4, wherein said first and second plasma-generating sections (A,B) are each supplied by an AC current.

6. Device (1) according to claim 5, wherein the first plasma-generating section (A) and the second plasma-generating section (B) are supplied with AC current of opposite phase.

7. Device (1) according to one of claims 5 or 6, wherein the first plasma-generating section (A) and the second plasma-generating section (B) are supplied with AC current of the same amplitude.

8. Device (1) according to one of claims 5 to 7, wherein the frequency of the current(s) is/are in the range from DC to about 500 kHz of AC.

9. Device (1) according to one of claims 1,3 or 4, wherein said first and second plasma-generating sections (A,B) are supplied with DC current.

10. Device (1) according to one of claims 4 to 9, wherein the difference in potential between the electrodes (8,9) is adapted suchlike that an electric field in the range of about 30 kV/cm is created nearby the electrode (8).

11. Device (1) according to one of claims 1 to 10, wherein said first and said second plasma-generating sections (A,B) are integrated in a flow-through housing (5), possessing an inlet (6) and an outlet (7) for a gaseous medium (4).

12. Device (1) according to claim 11, wherein said flow-through housing (5) allows for a division of incoming fluid into separate streams (S), and wherein said streams (S) are each contacted with at least one of said first or second plasmas (2,3).

13. Device (1) according to one of claims 11 or 12, wherein said first plasma-generating section (A) and said second plasma-generating section (B) are arranged alternatingly between inlet (6) and outlet (7).

14. Device (1) according to one of claims 1 to 13, wherein at least one electrode of the first plasma-generating section (A) is electrically coupled to, preferably formed in one piece with, at least one electrode of the second plasma-generating section (B).

15. Device (1) according to claim 14, wherein the electrode of the first plasma-generating section (A), which is electrically coupled to, preferably formed in one piece with, at least one electrode of the second plasma-generating section (B), is formed as a hollow body, preferably a hollow cylinder, possessing a plurality of tips (9) on at least one end of the hollow body.

16. Use of a device (1) according to one of claims 1 to 15 for the sterilization of the gaseous medium (4).

17. A method of treating a gaseous medium (4) with a plasma-derived reactive species, the method comprising the steps of:
- generating at least one first plasma (2);
- generating at least one second plasma (3);

wherein said first and said second plasmas (2,3) are of different polarity;

- contacting the gaseous medium (4) with said first and said second plasma (2,3).

18. A method according to claim 17, wherein the gaseous medium (4) is conveyed with a conveyance-velocity which is chosen suchlike that substantially all of the gaseous medium (4) is subjected to plasmas (2,3) of different polarity at least once.

19. A method according to claim 17 or 18, wherein

- the at least one first plasma (2) is generated in at least one first plasma-generating section (A);
- the at least one second plasma (3) is generated in at least one second plasma-generating section (B),
- wherein at a given point of time said first and said second plasmas (2,3) are of different polarity.

20. Method according to one of claims 17 to 19, wherein said first and second plasmas (2,3) are corona discharge plasmas.

21. Method according to one of claims 17 to 20, wherein said first and second plasma-generating sections (A,B) are supplied with AC current.

22. Method according to claim 21, wherein the first and the second plasma-generating sections (A,B) are supplied with AC current of opposite phase.

23. Method according to claim 22, wherein the first and the second plasma-generating sections (A,B) are supplied with AC current of the same amplitude.

24. Method according to one of claims 21 to 23, wherein the frequency of the current(s) is/are in the range of DC to about 500 kHz.

25. Method according to one of claims 17 to 21, wherein said first and second plasma-generating sections (A,B) are supplied with DC current.

26. Method according to one of claims 17 to 25, wherein said first and said second plasmas (2,3) are generated in a flow-through housing (5), possessing an inlet (6) and an outlet (7).

27. Method according to claim 26, wherein said gaseous medium (4) is divided in separate streams (S) within said flow-through housing (5), and wherein said streams (S) are each contacted with at least one of said first or second plasmas (2,3).

28. Method according to one of claims 26 or 27, wherein the gaseous medium (4) is subsequently contacted between the inlet (6) and the outlet (7) of the flow-through housing (5) with said first plasma (2) and said second plasma (3), or vice versa.

29. Use of a method according to one of claims 17 to 28 for the sterilization of the gaseous medium (4).

30. Method of controlling the treatment of a gaseous medium (4) in a plasma-generating device (1), preferably according to one of claims 1 to 15, especially operated by a method according to one of claims 17 to 28, wherein the conveyance-velocity of a gaseous medium (4) through the device (1) and the frequency of an AC power supply (18) connected to plasma-generating electrodes (8,9) are co-ordinated such-like to allow for substantially all of the gaseous medium (4) being subjected to plasmas (2,3) of different polarity at least once.